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SEQUENCE LISTING
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<110> Eisenberg, Stephen P.
 Case, Casey C.
 Cox III, George N.
 Jamieson, Andrew
 Rebar, Edward J.
 Sangamo Biosciences, Inc.

<120> Selection of Sites for Targeting by Zinc Finger Proteins and Methods of Designing Zinc Finger Proteins to Bind to Preselected Sites

<130> 019496-001800US

<140 US 09/229,007 <141 1999-01-12

<160> 97

<170> PatentIn Ver. 2.1

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Cys Arg Ile Cys Met Arg Asn Phe Ser Arg Ser Asp His Leu Thr Thr 35 40 45

His Ile Arg Thr His Thr Gly Glu Lys Pro Phe Ala Cys Asp Ile Cys 50 60

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His Leu Arg Gln Lys

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Val Tyr Gly Lys Thr Ser His Leu Arg Ala His Leu Arg Trp His Thr 20 25 30

Gly Glu Arg Pro Phe Met Cys Thr Trp Ser Tyr Cys Gly Lys Arg Phe 35 40 45

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Thr Arg Ser Asp Glu Leu Gln Arg His Lys Arg Thr His Thr Gly Glu 50 60

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Arg Ala His Gln Arg Thr His Thr Gly Glu Arg Pro Tyr Lys Cys Pro
35 40 45

Glu Cys Gly Lys Ser Phe Ser Arg Ser Asp Glu Leu Gln Arg His Gln 50 55 60

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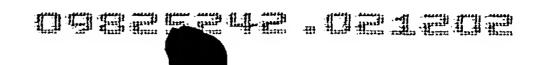
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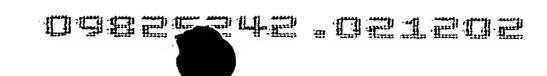
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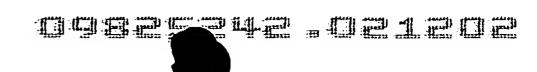
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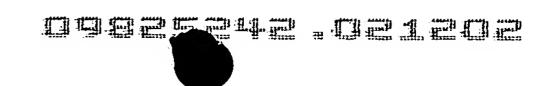
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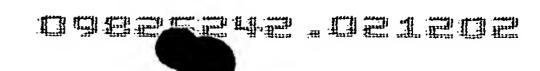


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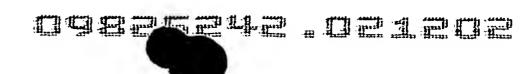
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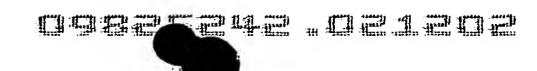
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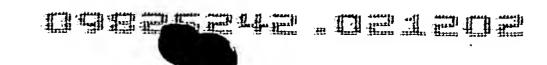
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```

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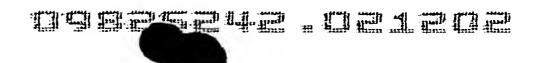
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knnknnkngg nnknnknggn nn
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      motif searched by protocol 2
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<220>
<221> modified_base
<222> (12)..(13)
<223> n = g, a, c or t, may be present or absent
<400> 51
                                                                    23
knnknnkngg nnnknnkngg nnn
<210> 52
<211> 22
<212> DNA
<213> Artificial Sequence
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      motif searched by protocol 2
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<223> n = g, a, c or t
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<221> modified_base
<222> (11)..(12)
<223> n = g, a, c or t, may be present or absent
<400> 52
knnknnkngg nnknnknnkn gg
                                                                    22
<210> 53
<211> 23
<212> DNA
<213> Artificial Sequence
<220>
<223> Description of Artificial Sequence:target site DNA
      motif searched by protocol 2
```

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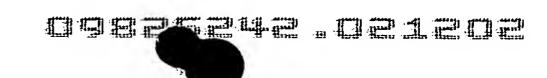
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<220>
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knnknnkngg nnnknnknnk ngg
                                                                    23
<210> 54
<211> 19
<212> DNA
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      motif searched by protocol 2
<220>
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<211> 19
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<210> 56
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<213> Artificial Sequence
<220>
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      motif searched by protocol 2
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 $\varepsilon = \frac{1}{t^{1/2}} = \frac{\pi}{2}$



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<220>
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<222> (1)..(19)
<223> n = g, a, c or t
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knnknnkngg nnknnkngg
                                                                    19
<210> 57
<211> 22
<212> DNA
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<220>
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kngknnknnn nnkngknnkn nn
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<223> n = g, a, c or t
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<223> n = g, a, c or t, may be present or absent
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kngknnknnn nnnkngknnk nnn
<210> 59
<211> 22
<212> DNA
<213> Artificial Sequence
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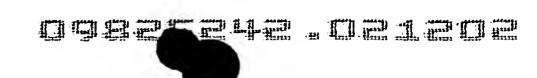
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<220>
<223> Description of Artificial Sequence:target site DNA
      motif searched by protocol 3
<220>
<221> modified_base
<222> (1)..(22)
<223> n = g, a, c or t
<220>
<221> modified_base
<222> (10)..(12)
<223> n = g, a, c or t, may be present or absent
<400> 59
kngknnknnn nnknnkngkn nn
                                                                    22
<210> 60
<211> 23
<212> DNA
<213> Artificial Sequence
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      motif searched by protocol 3
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<220>
<221> modified base
<222> (11) ... (13)
<223> n = g, a, c or t, may be present or absent
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kngknnknnn nnnknnkngk nnn
                                                                    23
<210> 61
<211> 22
<212> DNA
<213> Artificial Sequence
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<223> n = g, a, c or t
<220>
<221> modified_base
<222> (10)..(12)
<223> n = g, a, c or t, may be present or absent
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<400> 61
                                                                    22
kngknnknnn nnknnknnkn gk
<210> 62
<211> 23
<212> DNA
<213> Artificial Sequence
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<223> n = g, a, c or t
<220>
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<222> (11)..(13)
<223> n = g, a, c or t, may be present or absent
<400> 62
                                                                    23
kngknnknnn nnnknnknnk ngk
<210> 63
<211> 22
<212> DNA
<213> Artificial Sequence
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      motif searched by protocol 3
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<222> (1) .. (22)
<223> n = g, a, c or t
<220>
<221> modified_base
<222> (10)..(12)
<223> n = g, a, c or t, may be present or absent
<400> 63
                                                                    22
knnkngknnn nnkngknnkn nn
<210> 64
<211> 23
<212> DNA
<213> Artificial Sequence
<220>
<223> Description of Artificial Sequence:target site DNA
      motif searched by protocol 3
```

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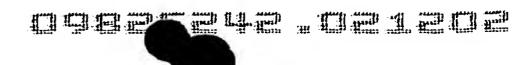
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<223> n = g, a, c or t
<220>
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<223> n = g, a, c or t, may be present or absent
<400> 64
                                                                    23
knnkngknnn nnnkngknnk nnn
<210> 65
<211> 22
<212> DNA
<213> Artificial Sequence
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      motif searched by protocol 3
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<223> n = g, a, c or t
<220>
<221> modified_base
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<223> n = g, a, c or t, may be present or absent
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knnkngknnn nnknnkngkn nn
                                                                    22
<210> 66
<211> 23
<212> DNA
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      motif searched by protocol 3
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<223> n = g, a, c or t
<220>
<221> modified_base
<222> (11) . . (13)
<223> n = g, a, c or t, may be present or absent
<400> 66
                                                                    23
knnkngknnn nnnknnkngk nnn
```

w; (3):--**

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<210> 67
<211> 22
<212> DNA
<213> Artificial Sequence
<220>
<223> Description of Artificial Sequence:target site DNA
      motif searched by protocol 3
<220>
<221> modified_base
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<223> n = g, a, c or t
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<222> (10)..(12)
<223> n = g, a, c or t, may be present or absent
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                                                                     22
knnkngknnn nnknnknnkn gk
<210> 68
<211> 23
<212> DNA
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      motif searched by protocol 3
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<223> n = g, a, c or t
<220>
<221> modified_base
<222> (11) . . (13)
<223> n = g, a, c or t, may be present or absent
<400> 68
knnkngknnn nnnknnknnk ngk
                                                                    23
<210> 69
<211> 22
<212> DNA
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<223> Description of Artificial Sequence:target site DNA
      motif searched by protocol 3
<220>
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<222> (1)..(22)
<223> n = g, a, c or t
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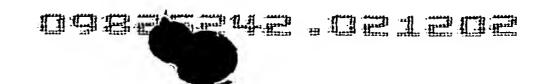


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<220>
<221> modified_base
<222> (11)..(12)
<223> n = g, a, c or t, may be present or absent
<400> 69
knnknnkngk nnkngknnkn nn
                                                                    22
<210> 70
<211> 23
<212> DNA
<213> Artificial Sequence
<220>
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      motif searched by protocol 3
<220>
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<223> n = g, a, c or t
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<221> modified_base
<222> (12)..(13)
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<400> 70
                                                                    23
knnknnkngk nnnkngknnk nnn
<210> 71
<211> 22
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      motif searched by protocol 3
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<221> modified base
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<220>
<221> modified base
<222> (11)..(12)
<223> n = g, a, c or t, may be present or absent
<400> 71
                                                                    22
knnknnkngk nnknnkngkn nn
<210> 72
<211> 23
<212> DNA
<213> Artificial Sequence
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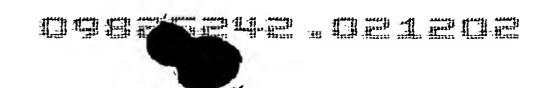
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<223> n = g, a, c or t
 <220>
<221> modified_base
<222> (12)..(13)
 <223> n = g, a, c or t, may be present or absent
 <400> 72
knnknnkngk nnnknnkngk nnn
                                                                    23
 <210> 73
<211> 22
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 <221> modified_base
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 <400> 73
                                                                     22
knnknnkngk nnknnknnkn gk
 <210> 74
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       motif searched by protocol 3
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 <223> n = g, a, c or t
 <220>
<221> modified_base
 <222> (12)..(13)
 <223> n = g, a, c or t, may be present or absent
```

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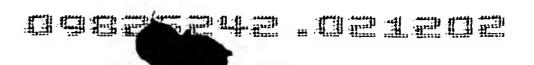
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<400> 74
knnknnkngk nnnknnknnk ngk
                                                                   23
<210> 75
<211> 19
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<221> modified_base
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knnknnkngk ngknnknnn
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<210> 76
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<223> n = g, a, c or t
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knnknnkngk nnkngknnn
                                                                    19
<210> 77
<211> 19
<212> DNA
<213> Artificial Sequence
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      motif searched by protocol 3
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<221> modified_base
<222> (1)..(19)
<223> n = g, a, c or t
<400> 77
                                                                    19
knnknnkngk nnknnkngk
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	•	
-010- 70		
<210> 78		
<211> 10		
<212> DNA		
<213> Glycine max		
<220>		
<223> soybean FAD2-1 cDNA ZFP target segment FAD 1		
<400> 78		
anaat nanaa	. 10	
gaggtagagg	. 10	
,		
·		
<210> 79		
<211> 10		
<212> DNA		
<213> Glycine max		
allor official mair		
<220>		
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.400 - 70		
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gtcgtgtgga	10	
<210> 80		
<211> 10		
<212> DNA		
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<220>		
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(225) Boybean 1122 2 came cargos regiments		
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gttgaggaag	10	
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<211> 10		
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-224		
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	10	
taggtggtga	10	

r a co



<210>	83	
<211>	12	
<212>		
	Artificial Sequence	
\Z1J/	Arciriciar bequence	
.000.		
<220>		_
<223>	Description of Artificial Sequence: test sequence	e
<400>	83	
agtgc	geggt ge	12
<210>	84	
<211>	10	
<212>		
	Artificial Sequence	
\Z13/	Arciriciar boquenes	
42205		
<220>	Description of Autificial Companyon target gite	
<223>	Description of Artificial Sequence: target site	
	with base immediately to the 3' side of target	
	site	
<400>	84	
agtgc	geggt	10
<210>	85	
<211>		
<212>		
<213>	Artificial Sequence	
<220>		
<223>	Description of Artificial Sequence: target site	
	with base immediately to the 3' side of target	
	site	
<400>	85	
gtgcg	eggtg	10
J J J		
<210>	86	
<211>		
<212>		
<213>	Artificial Sequence	
<220>		
<223>	Description of Artificial Sequence:target site	
	with base immediately to the 3' side of target	
	site	
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tgcgcg		10
ر د ر د د		
<210>	87	
<211>		
<212>		
<213>	Artificial Sequence	

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<220>
<223> Description of Artificial Sequence:target site
      with base immediately to the 3' side of target
      site
<220>
<221> modified_base
<222> (10)
\langle 223 \rangle n = undefined
<400> 87
gcgcggtgcn
<210> 88
<211> 7
<212> PRT
<213> Artificial Sequence
<220>
<223> Description of Artificial Sequence: finger F3 for
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<400> 88
Glu Arg Asp His Leu Arg Thr
                   5
  1
<210> 89
<211> 7
<212> PRT
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<220>
<223> Description of Artificial Sequence: finger F2 for
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<400> 89
Arg Ser Asp Glu Leu Gln Arg
<210> 90
<211> 7
<212> PRT
<213> Artificial Sequence
<220>
<223> Description of Artificial Sequence:finger F1 for
      ordered output from optimal design target site
<400> 90
Arg Lys Asp Ser Leu Val Arg
<210> 91
<211> 7
<212> PRT
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<213> Artificial Sequence

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<220>

<223> Description of Artificial Sequence: finger for disordered output from optimal design target site

<400> 91

Arg Ser Asp Glu Leu Thr Arg
1 5

<210> 92

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:finger for
 disordered output from optimal design target site

<400> 92

Arg Ser Asp Glu Arg Lys Arg

<210> 93

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:three finger
ZFP design using F3, F2 and F1 fingers for ordered
output from optimal design target site

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Arg Lys Asp Ser Leu Val Arg Arg Ser Asp Glu Leu Gln Arg Glu Arg 1 5 10 15

Asp His Leu Arg Thr

20

<210> 94

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:ZFP sequence
(F1, F2 and F3) from SBS design GR-223

<400> 94

Arg Ser Ala Asp Leu Thr Arg Arg Ser Asp His Leu Thr Arg Glu Arg

1 10 15

Asp His Leu Arg Thr

15

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<210> 95
<211> 21
<212> PRT
<213> Artificial Sequence
<220>
<223> Description of Artificial Sequence: ZFP sequence
      (F1, F2 and F3) from Zif 268
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Arg Ser Asp Glu Leu Thr Arg Arg Ser Asp His Leu Thr Thr Arg Ser
                                      10
Asp Glu Arg Lys Arg
             20
<210> 96
<211> 21
<212> PRT
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      (F1, F2, F3) from SP1
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Lys Thr Ser His Leu Arg Ala Arg Ser Asp Glu Leu Gln Arg Arg Ser
                                      10
  1
Asp His Leu Ser Lys
             20
<210> 97
<211> 21
<212> PRT
<213> Artificial Sequence
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<220> <223> Description of Artificial Sequence: ZFP sequence (F1, F2, F3) from SBS design GL-8.3.1

<400> 97

Arg Lys Asp Ser Leu Val Arg Thr Ser Asp His Leu Ala Ser Arg Ser 10

Asp Asn Leu Thr Arg 20